University of Arkansas at Monticello
Academic Unit Annual Report

Unit: Mathematics and Natural Sciences

Academic Year: 2018-2019

What is the Unit Vision, Mission and Strategic Plan including goals, actions and key performance indicators (KPI)?

The School of Mathematical and Natural Sciences comprises the disciplines of biology, chemistry, computer science, earth science, mathematics, mathematics education, physical science, physics, and science education. The School has majors in Biology, Chemistry, Mathematics, and Natural Sciences.

Mission

The mission of the School of Mathematical and Natural Sciences is to offer specialization in biology, chemistry, mathematics, and natural science and to provide opportunities for all students to enhance their understanding of science and mathematics. Curricula offered in the School prepare graduates for careers in industry and teaching, for graduate studies, and for admission to professional programs including allied health, dentistry, medicine, optometry, pharmacy, and veterinary medicine. This mission is fulfilled through the following goals:

1. To provide academic programs which promote the development of professional scientists and mathematicians and provide opportunities for all students to enhance their understanding of the natural sciences and mathematics.

2. To prepare individuals for successful careers in industry and teaching and for graduate studies in science and mathematics.

3. To provide curricula for pre-professional studies in dentistry, medicine, optometry, pharmacy, and allied health (physical therapy, radiological technology, respiratory therapy, medical technology, occupational therapy, and dental hygiene).

4. To provide technical and analytical courses to support studies in agriculture, forestry, nursing, physical education, psychology, and wildlife management.

5. To serve the general education program through courses in biology, chemistry, earth science, mathematics, physics, and physical science that provide a basic background for a baccalaureate degree.

In Table 1, provide assessment of progress toward meeting KPIs during the past academic year and what changes, if any, might be considered to better meet goals.

Table 1: Assessment of Key Performance Indicators –From 2018-2019 Academic Year

KPI	Assessment of Progress	Implications for Future Planning/Change
Listed under the goal: Maintaining Quality Academic Programs		
Complete review of the Biology Curriculum	>95% completed. See specific changes in the curriculum changes given later in this report	Pre-requisite courses still need adjusting slightly to be in line with Degree Pathways.
Complete review of the Mathematics Curriculum	>90% completed. See specific changes in the curriculum changes given later in this report	Alternate options are still being investigated in order to increase enrollment in Mathematics. It is likely that an increased focus on Statistics will be present in the future. This will have to be taken into consideration anytime a new tenure track faculty member is hired.
Complete review of the Chemistry Curriculum	Discussions held; however, no actions taken at this point	The review will continue into the following year. Our program will be compared to the recommendations made by the American Chemical Society.
Complete review of the Natural Science Curriculum	No progress made in this area due to the strong link between this major and the Biology and Chemistry curricula changes being made this year.	The goals of the students entering this major are greatly different than they were 17 years ago when the degree was developed. Some fine tuning is necessary in both options to better serve the students in this degree
Review success rates in developmental and gateway courses, and improve by in future years	Pass rates have been measured and analyzed for gateway and remedial courses	Changes are already in the process of being implemented that will hopefully improve the pass rates in the future. This will be ongoing.
By the end of the academic year, identify equipment and technology needs of each program and make repairs to current non-functioning equipment.	Much of the equipment has been inspected and assessments have been done on what it might take to repair or replace.	A complete instrument inventory is planned for this year. Feasibility of repairs will be based on condition of equipment, cost to repair, cost to replace, and how critical the needs are for the program. A detailed report is planned by the end of 2019-20.

KPI	Assessment of Progress	Implications for Future Planning/Change
Listed under the goal: Enrollment and Retention Gains		
Increase the number of Math and Science majors as incoming freshmen	Even though we were successful in building relationships with some teachers in the area (largely through the STEM Center), and developing a recruiting card (Points of Pride) initial enrollments do not indicate an increase in enrollment in our majors courses. We have not made progress on the additional radio advertisements that were planned.	With loss of the STEM Center on campus, we plan to get involved with the Southeast Arkansas Educational Co-op math and science specialists to try to get involved with teacher workshops and other activities held at the schools. We hope to become a presence in every school in the region, and even some that we don't normally consider to be within our region. We plan to do more direct recruiting from the school of Math and Sciences office to the higher ACT students that normally do well in our majors.

Strategic Plan 2019-20

Unit: School of Mathematics and Natural Sciences				
Goal	**Strategies/Action Steps**	**Desired Outcomes**	**Measures/Assessments of Success/Progress**	**Projected Timeline**
1. Develop, deliver, and maintain quality academic programs	1A. Review the Chemistry curriculum and update as needed. Review individual courses to see if improvements are needed to stay current. (Carried over from last year)	1A. Better prepare chemistry majors for graduate programs, professional schools, and employment opportunities. If possible, a second outcome would be streamlining the course offerings by allowing certain courses to count in both options of the chemistry degree	By the end of the academic year, have submitted proposals to C&S for any changes needed.	1 year
	1B. Review the Natural Science curriculum and update as needed. (Carried over from last year)	1B. Develop curricular options that are more appropriate for allied health majors since that group is the largest segment of those choosing this major.	By the end of the academic year, have submitted proposals to C&S for any changes needed.	1 year

Unit: School of Mathematics and Natural Sciences				
Goal	**Strategies/Action Steps**	**Desired Outcomes**	**Measures/Assessments of Success/Progress**	**Projected Timeline**
1. Develop, deliver, and maintain quality academic programs (continued)	1C. Review retention and success rates of our majors compared to ACT scores and if needed, set standards for admission into specific majors and programs.	Increase retention of the lower ACT students by not putting them into major courses for which they aren't academically prepared.	Higher freshman retention rate	2-3 years then ongoing
	1D. Review remedial mathematics courses and make appropriate changes to allow students the best chance of being successful at completing their gateway mathematics course in a timely fashion.	Give the students the shortest plausible pathway to completing required general education math courses while maintaining or improving the pass rates	By the end of the academic year, have submitted proposals to C&S for any changes needed. Improve pass rates in gateway math courses over the current pass rates	1-2 years then ongoing
	1E. Review the pre-engineering curriculum and make changes as needed.	Make it possible for pre-engineering students to transfer to accredited engineering programs, or encourage more students to enter technical engineering related programs at the Colleges of Technology	Have a new pre-engineering curriculum developed, and by the end of the academic year, have submitted proposals to C&S for any changes needed.	1-2 years
2. Provide an excellent environment for learning	2A. Upgrade the computer facilities in teaching spaces	New computers and upgrade document cameras, monitors, and projectors in all classrooms.	New or upgraded equipment in all teaching spaces	1 year
	2B. Undergo a major Science Center cleanup	M&R equipment that is no longer used or cannot be repaired. Removal of other items that have been saved through the years.	Removal of all equipment and computers that have gone through M&R process. Other junk disposed of appropriately. Thorough cleaning of all classrooms, labs, and stockrooms. Complete inventory of equipment and supplies.	1-2 years

List, in Table 2B, the Academic Unit Student Learning Outcomes (SLO) and the alignment with UAM Student Learning Outcomes, and Unit Vision, Mission, and Strategic Plans

Table 2A: University Student Learning Outcomes

Communication: Students will communicate effectively in social, academic, and professional contexts using a variety of means, including written, oral, quantitative, and/or visual modes as appropriate to topic, audience, and discipline.
Critical Thinking: Students will demonstrate critical thinking in evaluating all forms of persuasion and/or ideas, in formulating innovative strategies, and in solving problems.
Global Learning: Students will demonstrate sensitivity to and understanding of diversity issues pertaining to race, ethnicity, and gender and will be capable of anticipating how their actions affect campus, local, and global communities.
Teamwork: Students will work collaboratively to reach a common goal and will demonstrate the characteristics of productive citizens.

Table 2B: Unit Student Learning Outcomes

Unit Student Learning Outcomes	University Student Learning Outcome	Alignment with UAM/University Vision, Mission and Strategic Plan	Alignment with Unit Vision, Mission, and Strategic Plan
Be able to clearly express mathematical and/or scientific ideas in oral and written communication	Communication Critical Thinking Global Learning Teamwork	These skills are necessary for our graduates to contribute to the economic and quality of life indicators in the community, state, and region.	The curricula in Math and Sciences are the foundations for the content knowledge needed for this SLO. The upgrading of the major program requirements is important in keeping the programs up to date and relevant.
Be able to demonstrate the ability to apply scientific and/or mathematical concepts to real world situations	Critical Thinking Global Learning Teamwork	This is the basis for our graduates to succeed in a global environment, be successful in entrepreneurial endeavors, and be a productive member of the community	Our mission states that we wish to provide opportunities for our students to improve their understanding of math and science concepts and provide proper training in these concepts in our support courses to other academic units.
Have a core knowledge of the major discipline	Communication Critical Thinking	These are skills required to be a productive member of any educational, healthcare, industrial or business in our community.	Core knowledge for all students is part of our mission statement, and is related to the curricula upgrades in the strategic plan. Improvements to

Unit Student Learning Outcomes	University Student Learning Outcome	Alignment with UAM/University Vision, Mission and Strategic Plan	Alignment with Unit Vision, Mission, and Strategic Plan
			provide an excellent learning environment are crucial for developing the core knowledge of the discipline
Be prepared for immediate employment in a scientific, technical, medical, or educational environment	Communication Critical Thinking Global Learning Teamwork	The world is becoming more technical in nature and our graduates must be prepared to fill the technology related roles in the community.	It is a major component found in our mission statement. It is strongly related to the updating of curricula as part of our strategic plan to make sure our programs are current and relevant.
Be prepared to enter graduate or professional school in the appropriate area	Communication Critical Thinking Global Learning Teamwork	A major factor in quality of life in any community is the quality of the health care system. Our programs are very successful at preparing students for all health care professional programs.	One of the major components of the mission statement for Math and Sciences is to prepare our students for graduate and pre-professional programs.

Describe how Student Learning Outcomes are assessed in the unit and how the results/data are used for course/program/unit improvements?

The Student Learning Outcomes (SLOs) are measured in our courses through student performance on exams, quizzes, laboratory exercises, field course journals, homework assignments, research projects, reports, and presentations. Further assessment is done using performance on nationally normed examinations such as the American Chemical Society (ACS) standardized final examinations and pre-professional placement exams such as GRE, PCAT, MCAT, OAT, and DAT and post graduate placement into graduate programs, professional programs, and employment.

Public/Stakeholder/Student Notification of SLOs

List all locations/methods used to meet the HLC requirement to notify the public, students and other stakeholders of the unit SLO an. (Examples: unit website, course syllabi, unit publications, unit/accreditation reports, etc.)

- Posted in the glass case at the main entrance to the Science Center
- Posted on the School of Math and Sciences website at: http://uam-web2.uamont.edu/pdfs/mnsciences/mns%20student%20learning%20outcomes.pdf
- Course syllabi

Enrollment

Table 3: Number of Undergraduate and Graduate Program Majors (Data Source: Institutional Research)

UNDERGRADUATE PROGRAM MAJOR: BIOLOGY					
Classification	**Fall 2016**	**Fall 2017**	**Fall 2018**	**3-Year Total & Average**	
Freshman	31	36	20	87 / 29	
Sophomore	10	18	20	48 / 16	
Junior	19	9	23	51 / 17	
Senior	16	21	32	69 / 23	
Post Bach	1	0	0	1 / 0.3	
Total	77	85	95	257 / 85.7	
UNDERGRADUATE PROGRAM MAJOR: CHEMISTRY					
Classification	**Fall 2016**	**Fall 2017**	**Fall 2018**	**3-Year Total & Average**	
Freshman	14	10	8	32 / 10.7	
Sophomore	8	6	10	24 / 8	
Junior	5	8	16	29 / 9.7	
Senior	4	7	14	25 / 8.3	
Post Bach	0	0	0	0 / 0	
Total	31	31	48	110 / 36.7	

UNDERGRADUATE PROGRAM MAJOR: MATHEMATICS					
Classification	**Fall 2016**	**Fall 2017**	**Fall 2018**	**3-Year Total & Average**	
Freshman	8	9	3	20 / 6.7	
Sophomore	6	4	5	15 / 5	
Junior	2	3	0	5 / 1.7	
Senior	1	4	4	9 / 3	
Post Bach	0	0	0	0 / 0	
Total	17	20	12	49 / 16.3	

UNDERGRADUATE PROGRAM MAJOR: NATURAL SCIENCE					
Classification	**Fall 2016**	**Fall 2017**	**Fall 2018**	**3-Year Total & Average**	
Freshman	10	13	18	41 / 13.6	
Sophomore	4	5	9	18 / 6	
Junior	6	5	6	17 / 5.7	
Senior	6	5	2	13 / 4.3	
Post Bach	0	0	0	0 / 0	
Total	26	28	35	89 / 29.6	
UNDERGRADUATE PROGRAM MAJOR: PRE-ENGINEERING					
Classification	**Fall 2016**	**Fall 2017**	**Fall 2018**	**3-Year Total & Average**	
Freshman	9	5	6	20 / 6.7	
Sophomore	1	1	4	6 / 2	
Junior	0	0	0	0 / 0	
Senior	0	0	0	0 / 0	
Post Bach	0	0	0	0 / 0	
Total	10	6	10	26 / 8.7	

UNDERGRADUATE PROGRAM MAJOR: PRE-MEDICINE					
Classification	**Fall 2016**	**Fall 2017**	**Fall 2018**	**3-Year Total & Average**	
Freshman	14	13	15	42 / 16	
Sophomore	4	5	14	23 / 7.7	
Junior	3	5	13	21 / 7	
Senior	2	5	9	16 / 5.3	
Post Bach	0	0	0	0 / 0	
Total	23	28	51	102 / 34	
UNDERGRADUATE PROGRAM MAJOR: PRE-PHARMACY					
Classification	**Fall 2016**	**Fall 2017**	**Fall 2018**	**3-Year Total & Average**	
Freshman	6	4	7	17 / 5.7	
Sophomore	4	5	3	12 / 4	
Junior	2	3	7	12 / 4	
Senior	1	2	3	6 / 2	
Post Bach	0	0	0	0 / 0	
Total	13	14	20	47 / 15.7	

UNDERGRADUATE PROGRAM MAJOR: ALLIED HEALTH					
Classification	**Fall 2016**	**Fall 2017**	**Fall 2018**	**3-Year Total & Average**	
Freshman	9	14	18	41 / 13.7	
Sophomore	2	0	10	12 / 4	
Junior	1	2	3	6 / 2	
Senior	1	0	3	4 / 1.3	
Post Bach	0	0	0	0 / 0	
Total	13	16	34	63 / 21	

The above tables reflect the number of students within each major, so a student can be shown multiple times in this table. In Math and Sciences very few students are listed as a single major. Many that are listed as a single major are likely not listed correctly in WeevilNet. Typically students in the pre-medicine and pre-pharmacy plans are also biology and chemistry double majors. Pre-engineering plan students are listed as mathematics majors, and Allied Health plan students are listed as Natural Science majors. This is necessary due to financial aid laws prevent students from getting federal aid unless they are enrolled in a major that leads to a specific degree.

The School of Mathematical and Natural Sciences does not have any graduate programs; however a few graduate courses are offered from time to time largely as support courses for the graduate program in the School of Forestry, Agriculture and Natural Resources.

What do the data indicate in regard to strengths, weaknesses, opportunities for growth and threats to effectiveness?

Strengths

- Biology, Chemistry, Pre-Medicine, and Pre-Pharmacy have healthy numbers
- While some growth is attributed in part to better record keeping in WeevilNet, there is growth is indicated in Biology and Chemistry over the past several years.
- Allied Health shows good numbers of freshmen and sophomores; however, most of these students are not planning on a four year degree, and if they are successful they will likely be accepted into their professional program prior to earning an associates degree. This is one reason for the severe drop in numbers after the sophomore year. Several students each year are accepted into professional programs such as Dental Hygiene, Radiology Technology, Physical Therapy Assistant, etc...

Weaknesses

- Mathematics remains near the program viability line of 4 graduates per year over the previous three years. We are losing mathematically talented recruits to universities that have engineering programs. Lack of Physics or Engineering majors greatly limits the number of students coming to UAM that might potentially end up as a math major.
- Pre-Engineering program doesn't have the equipment, facilities, or faculty to offer even a basic program to recruit future engineers. Just this year, we began recommending that many of the pre-engineering students consider a technical program in an engineering related field at one of the Colleges of Technology. We should not be marketing what we do as pre-engineering.

Opportunities for Growth

- Even though the number of students in our programs may decline due to Degree Pathways, it should have a positive impact on student success and retention.
- Development of admissions standards for specific degree plans that go above and beyond Degree Pathways would likely help students get into a major more appropriate for their skill level and improve retention.
- Development of a true pre-engineering program, and possibly even an associates degree in that area, could increase the number of freshmen coming into UAM. With the high schools in the region greatly increasing the focus on STEM, and specifically engineering, more and more students are seeking majors in this area. For UAM to become a viable option for these students, it would require an initial investment to upgrade some facilities, and possibly even hire a faculty to teach the engineering specific courses. The possibility of offering some pre-engineering technical courses for the Crossett programs on the main campus could lead more students into their programs.

Threats to Effectiveness

- UAM was the exclusive Rural Health Early Acceptance Program for the UAMS College of Pharmacy. This year, they have expanded that program to include University of Arkansas, Arkansas Tech, and Arkansas State University. Over the past two years we have been able to recruit students from other parts of the state because of our exclusive agreement. It will be much more difficult to draw students from universities near their home.
- Loss of the STEM Center on the UAM campus has reduced the contact between the School of Math and Sciences and local school districts. This will hinder our ability to provide focused recruiting to the more academically prepared students that might be interested in our programs.
- Budgetary limitations are making it difficult to provide learning experiences for STEM majors. Increasing costs of supplies and travel are overtaking our budget. We are unable to make equipment repairs and purchases simply because the funds aren't available. In some instances, faculty are buying materials out-of-pocket in order to have appropriate supplies for instructional purposes.
- Loss of faculty. It is difficult to retain excellent faculty when they can start over at another university at the Assistant Professor level at a higher salary than they are currently earning at UAM. There were three faculty members that actively pursued other positions this spring.
- Declining population of students in southeast Arkansas school districts is making it difficult to recruit the higher ACT students needed for our programs. This makes it even more important that we recruit every high achieving student from this region.

Progression/Retention Data

Table 4: Retention/Progression and Completion Rates by Major (Data Source: Institutional Research)

First of all, there are questions concerning the accuracy of this data. It is common to have Biology majors switch to a Natural Science major as a junior or even a senior because they cannot pass the rigorous upper level biology and chemistry courses needed for their degree. The data we

received indicates that zero majors switched from their initial major as a sophomore to another major in Math and Sciences. The data also showed that zero majors switched from a Math and Science major to a major in another academic unit. While this is not a common occurrence, it does happen. It appears that once a change is made, it does away with the previous academic history Another issue with the data is that the number of majors in an academic year (Table 3) differs from the data provided for Retention and Progression (Table 4). While I wouldn't expect a perfect match due to students not completing 30 hours in an academic year, the discrepancy is quite large in some cases. The addition of a second major, or the removal of a second major, or changing your plans without officially having your major changed has created a nightmare for accurate record keeping. It gives the appearance of trends that aren't really there, or hides trends that would be more evident with more accurate records and data collection.

Name of Major: **Biology**

Academic Year:	2016 – 2017		2017-2018		2018 - 2019	
Number and percentage of majors who:	**#**	**%**	**#**	**%**	**#**	**%**
Entered as a Sophomore	18		28		22	
Graduated in major	10	56	5	18	0	0
Graduated in a second UAM major within the unit	3	17	1	4	0	0
Remain enrolled as an undergraduate at UAM	5	28	17	61	22	100
Accepted into a pre-professional program prior to earning BS degree	0	0	1	4	0	0
Left University	3	11	5	18	0	0
Students that have not earned a BS degree that earned an AA degree	3	17	6	21	2	9

Name of Major: **Biology**

Academic Year:	2016 – 2017		2017-2018		2018 - 2019	
Number and percentage of majors who:	**#**	**%**	**#**	**%**	**#**	**%**
Entered as a Junior	22		16		24	
Graduated in major	19	86	10	63	2	8
Graduated in a second UAM major within the unit	12	55	3	19	1	4
Remain enrolled as an undergraduate at UAM	0	0	4	25	19	79
Accepted into a pre-professional program prior to earning BS degree	2	9	0	0	1	4
Left University	1	5	2	13	2	8
Students that have not earned a BS degree that earned an AA degree	1	5	2	13	7	29

1. What does the data indicate about student progression from sophomore standing to junior standing and junior standing to senior standing?
In Biology, there appears to be about a consistent 10% loss of majors between sophomore and junior years and junior and senior years. Based on the skill levels of some of the students that were lost, it is likely those students had chosen a major that wasn't realistic for their skill level; however, there were a few similar students that had the grit to complete the degree.

2. What does the data indicate about retention from sophomore standing and junior standing to graduation?
Typically, once a student makes it into their junior year there is a high chance of graduating in that major. Last minute corrections, such as adding the second major, etc... gives the appearance of more majors graduating than were initially in the program one or two years before.

Name of Major: **Chemistry**

Academic Year: 2016 – 2017 2017-2018 2018 - 2019

Number and percentage of majors who:	#	%	#	%	#	%
Entered as a sophomore	10		13		13	
Graduated in major	5	50	1	8	0	0
Graduated in a second UAM major within the unit	2	20	1	8	0	0
Remain enrolled as an undergraduate at UAM	2	20	9	69	12	92
Accepted into a pre-professional program prior to earning BS degree	1	10	2	15	0	0
Left University	3	20	1	8	1	8
Students that have not earned a BS degree that earned an AA degree	1	10	3	23	3	23

Name of Major: **Chemistry**

Academic Year: 2016 – 2017 2017-2018 2018 - 2019

Number and percentage of majors who:	#	%	#	%	#	%
Entered as a Junior	6		11		13	
Graduated in major	4	67	7	64	1	8
Graduated in a second UAM major within the unit	3	50	4	36	1	8
Remain enrolled as an undergraduate at UAM	0	0	2	18	10	77
Accepted into a pre-professional program prior to earning BS degree	0	0	4	36	2	15
Left University	2	33	1	9	0	0
Students that have not earned a BS degree that earned an AA degree	0	0	1	9	3	23

1. What does the data indicate about student progression from sophomore standing to junior standing and junior standing to senior standing?
Although it isn't shown in this data, several chemistry majors are lost during the freshmen year. The ones that remain in the major as a sophomore still face the huge hurdle of the sophomore year courses, such as Organic Chemistry and Quantitative Analysis. Students that struggle at this level often switch from the double major back to a single major, or possibly to a Natural Science major; however, most do graduate with a degree in Math and Sciences.

2. What does the data indicate about retention from sophomore standing and junior standing to graduation?
The count of 8 chemistry majors in the Fall 2016, 8 in the Fall 2017, to 14 in the Fall 2108 indicates that several students officially added the chemistry degree as a second major very late in their career, such as immediately prior to graduation. While this gives the appearance of excellent retention in this degree, the sophomore year tends to be where many realize the rigors of this major, largely due to Organic Chemistry and Quantitative Analysis. Students that complete those courses typically remain on track to complete their degree.

Name of Major: **Mathematics**

Academic Year:	2016 – 2017		2017-2018		2018 - 2019	
Number and percentage of majors who:	**#**	**%**	**#**	**%**	**#**	**%**
Entered as a sophomore	7		4		5	
Graduated in major	4	57	0	0	0	0
Graduated in a second UAM major within the unit	1	14	0	0	0	0
Remain enrolled as an undergraduate at UAM	2	29	1	25	3	60
Accepted into a pre-professional program prior to earning BS degree	0	0	0	0	0	0
Left University	1	14	3	75	2	40
Students that have not earned a BS degree that earned an AA degree	1	14	0	0	0	0

Name of Major: **Mathematics**

Academic Year:	2016 – 2017		2017-2018		2018 - 2019	
Number and percentage of majors who:	**#**	**%**	**#**	**%**	**#**	**%**
Entered as a Junior	2		3		1	
Graduated in major	1	50	1	33	0	0
Graduated in a second UAM major within the unit	0	0	1	33	0	0
Remain enrolled as an undergraduate at UAM	0	0	1	33	1	100
Accepted into a pre-professional program prior to earning BS degree	0	0	0	0	0	0

Number and percentage of majors who:	#	%	#	%	#	%
Left University	1	50	1	33	0	0
Students that have not earned a BS degree that earned an AA degree	0	0	0	0	0	0

1. What does the data indicate about student progression from sophomore standing to junior standing and junior standing to senior standing?
Mathematics numbers are somewhat inflated during the freshmen and sophomore years due to the fact that pre-engineering majors are double listed as a mathematics major so they can receive financial aid as a degree seeking student. This gives the appearance of a very low retention rate; however, in reality, we are retaining a good portion of the students that began as a mathematics major. The bulk of those that are not being retained in the major are the pre-engineering majors that are often poorly prepared in mathematics. It would probably be better if some of these students were routed to a technical degree in engineering. They could then work toward the Bachelors of Applied Science or transfer to a B.S. Engineering program at an accredited university.

2. What does the data indicate about retention from sophomore standing and junior standing to graduation?
The number of true math majors is low, and a lot of effort goes into getting those students through the program. Special topics courses are offered occasionally, substitutions are made, and courses are sometimes even taught out of sequence to help the students graduate on schedule. Even then, we are always very near the viability line of an average of four graduates per year over a three year period. We do retain a good portion of our true math majors; however, we need to increase the numbers dramatically. Listing pre-engineering majors as math majors gives the appearance of terrible retention in this degree.

Name of Major: Natural Science

Academic Year: 2016 – 2017 2017-2018 2018 - 2019

Number and percentage of majors who:	#	%	#	%	#	%
Entered as a sophomore	7		5		7	
Graduated in major	0	0	0	0	0	0
Graduated in a second UAM major within the unit	0	0	0	0	0	0
Remain enrolled as an undergraduate at UAM	2	29	5	100	7	100
Accepted into a pre-professional program prior to earning BS degree	1	14	0	0	0	0
Left University	4	57	0	0	0	0
Students that have not earned a BS degree that earned an AA degree	3	43	3	60	3	43

Name of Major: **Natural Science**

Academic Year:	2016 – 2017		2017-2018		2018 - 2019		
Number and percentage of majors who:	#	%	#	%	#	%	
Entered as a Junior	7		4		3		
Graduated in major	2	29	2	50	0	0	
Graduated in a second UAM major within the unit	0	0	0	0	0	0	
Remain enrolled as an undergraduate at UAM	0	0	2	50	2	67	
Accepted into a pre-professional program prior to earning BS degree	1	14	0	0	0	0	
Left University	4	57	2	50	1	33	3
Students that have not earned a BS degree that earned an AA degree	1	14	1	25	1	33	1

1. What does the data indicate about student progression from sophomore standing to junior standing and junior standing to senior standing?
Very few students enroll initially into the Natural Science major with the intention of earning a degree in that area. Originally, the major was designed for those planning to teach science. The major was designed to provide the broad background needed to pass either the Life Science or Physical Science Praxis exam needed for licensure. About 10-12 years ago, Arkansas did away with this subject area of the Praxis exam and students now must pass a specific subject area, such as Chemistry, Physics, or Biology. Since then, the Natural Science major has served primarily as a safety net for those that tend to struggle in the biology or chemistry degrees. It has more recently become the chosen path for many of the Allied Health students. Those students are often double listed as a Natural Science major so they can receive financial aid. Only the Physical Therapy majors are required to stay until they complete the degree. Most leave as soon as the pre-requisite courses for the professional program are met. A few students may complete an associates prior to leaving, but most do not. It is extremely difficult to keep track of the students applying to programs since many do not require letters of reference. We encourage students to keep us informed, but many just disappear without giving us any information because they often find out they have been accepted during the summer months prior to starting the program in the fall. So, retention in this degree is very low, but it is almost impossible to retain a student who has no plans of being retained. Successful Allied Health students are the ones that aren't here long enough to get a degree. Only the ones not accepted are here long enough to get an AA degree.

2. What does the data indicate about retention from sophomore standing and junior standing to graduation? Other than those planning on Physical Therapy, the main group graduating in this major are those who switch from either Biology or Chemistry at the last minute because of difficulties in their initial major. Retention to the BS degree is extremely low.

What do the data indicate in regard to strengths, weaknesses, opportunities for growth and threats to effectiveness?

Strengths

- Excellent retention in biology and chemistry majors once they reach their junior year coursework.
- Natural Science degree provides a good alternative for students that get into trouble in their initial major.
- Allowing students with completed general education requirements, 93 hours, and 12 hours upper level credit to transfer hours back from professional programs to earn a bachelors degree.

Weaknesses

- Listing pre-allied health students as Natural Sciences and pre-engineering students as Mathematics majors creates the appearance of very low retention in those majors.
- Ability to recruit students with a strong math background into the math major

Opportunities for Growth

- Develop an engineering related degree as a bachelors or technical program that would attract students.
- Develop mathematics options geared more specifically to education or computer information systems that would help in recruiting students into that major, or create opportunities for double majoring.

Threats to Effectiveness

- Recruiting
    - Inability to bring in mathematically prepared students because of lack of physics and engineering degrees.
    - Loss of exclusive status in the RHEAP early admissions program with the UAMS College of Pharmacy
    - Declining number of graduates in the southeastern Arkansas primary service area.
    - Increased recruiting efforts by other universities for the better students in this region.
    - Decline of math and technology related jobs in the region.

- Increasing costs and stagnant budgets
    - Lab equipment initial cost and repairs limits hands on opportunities.
    - Travel to professional meetings for students is quite expensive

Gateway Course Success (Applies only to units teaching Gateway Courses: Arts/Humanities, Math/Sciences, Social Behavioral) (Data Source: Institutional Research)

Table 5: Gateway Course Success*

Course/Remediation		2016-2017 *Passed		2016-2017 Failed		2017-2018 *Passed		2017-2018 Failed		2018-2019 Passed		2018-2019 Failed		3-Year Trend *Passed		3-Year Trend Failed	
		#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
MATH 1003	Survey of Math	183 / 75%		62 / 25%		185 / 66%		95 / 34%		140 / 65%		77 / 35%		518 / 70%		224 / 30%	
MATH 1103	Survey of Math with Review (co-req remediation)					38 / 38.4%		60 / 61.6%		99 / 51%		97 / 49%		137 / 47%		157 / 53%	
MATH1033	Trigonometry	75 / 64%		43 / 36%		84 / 61%		54 / 39%		63 / 60%		42 / 40%		222 / 61%		139 / 39%	
MATH 1043	College Algebra	501 / 61%		320 / 39%		396 / 64%		221 / 36%		192 / 64%		107 / 36%		1089 / 64%		648 / 36%	
MATH 1143	College Algebra with Review (co-req remediation)	26 / 81%		6 / 19%		52 / 53%		46 / 47%		26 / 59%		18 / 41%		104 / 60%		70 / 40%	
MATH 2255	Calculus I	47 / 61%		30 / 39%		34 / 50%		34 / 50%		33 / 54%		28 / 46%		114 / 55%		92 / 45%	

*Passed = A, B, or C; Failed = D, F, or W

What do the data indicate in regard to strengths, weaknesses, opportunities for growth and threats to effectiveness?

Strengths

- The pass rate for College Algebra with Review is higher than College Algebra despite having less prepared students
- Even though the Survey of Math with Review pass rate is significantly lower than that of Survey of Math, the students in Survey of Math with Review are completing both their remediation and college-level math requirement in one term.
- Increased number of contact hours for the students in the "with Review" courses
- Scheduling format allows "with Review" courses to be taught at a slower pace
- "With Review" courses get more time for hands-on practice.

Weaknesses

- Students in allied health fields are still required to take College Algebra.
- Increasing number of students taking concurrent credit math still in high school will never take a math class in college and ultimately will not be recruited into a math major.
- "With Review" courses have little flexibility in scheduling

Opportunities for Growth

- Development of co-requisite college algebra pathway

Threats to Effectiveness

- Desire to improve flexibility in "with Review" courses could eliminate some of the positives accomplished by the 5 day per week schedule.
- Breaking the College Algebra and Survey of Math students into smaller groups based on ACT makes schedule planning very difficult

Completion (Graduation/Program Viability)

Table 6: Number of Degrees/Credentials Awarded by Program/Major (Data Source: Institutional Research)

Undergraduate Program/Major	Number of Degrees Awarded				
	2016-2017	2017-2018	2018-2019	Three-Year Total	Three-Year Average
Biology	18	21	22	61	20.3
Chemistry	13	14	12	39	13
Mathematics	0	5	4	9	3
Natural Science	7	2	5	14	4.7

Provide an analysis and summary of the data related to Progression/Retention/Program Viability including future plans to promote/maintain program viability.

Biology maintains a healthy number of majors each year, graduating approximately 20 per year. A large portion of those are the traditional option, and typically there are 1 or 2 organismal option majors graduating each year. Luckily the Organismal option doesn't require many courses that only they would take. The only course that fits that description at this time is Intro to Organic and Biochemistry Lab. As of now, the course is offered "as needed" with an enrollment of 3-4 students once every two years. We are reviewing this requirement at this time and may remove that course from the major requirements for that major.

Chemistry graduates an average of 13 per year which appears to well above the viability line of an average of four per year; however, most of the chemistry majors are the biochemistry option, and a large percentage of those are double majors with biology. The traditional chemistry degree graduated only 1 student this year. The remainder were biochemistry option. Having this low number in the traditional chemistry degree makes it very difficult to offer the courses specific to that degree in a timely fashion for students to graduate on time. Trying to recruit traditional chemistry majors is difficult because of the heavy mathematics component in that major. This major is designed mainly for those wanting to enter a chemical industry at the bachelors level or, more commonly, enter a Ph.D. program in chemistry.

Mathematics tends to be the major that flirts with the viability line. Because of having zero graduates in 2016-2017 in that major, this year's three year average will drop below the minimum of four graduates per year. This year's small junior class (1 student according to Table 4) doesn't appear to get the average over the line next year. There is at least one student that lacks only one course to complete the degree that is being recruited to come back and finish. If another graduate can be produced it is possible to get the three year average up to four by next year. The following year

appears to have several more majors in place and should help the three year average considerably. Mathematics faculty are making efforts to recruit more majors. They are considering offering different options for the mathematics major in hopes of luring more people into that program. One curriculum change has been made in the past year to help students transition from the calculations based courses to the proofs based courses. An introductory level statistics course has also been added to the curriculum in order to provide more opportunities for those not planning on entering an education field. Discussions are currently being held with the dean of Computer Information Systems concerning the possibility of a double major program. Another item being considered is to offer an Applied Mathematics Option to the Mathematics degree, which could be popular with the stronger mathematically prepared pre-engineering students. Ultimately, this program needs to grow if it is going to remain viable.

The viability numbers for the Natural Science major are slightly above the needed three year average of four graduates per year; however, for all practical purposes, this degree is a cognate of biology and chemistry. Every course found in this major is either a general education course, a required course, or an elective found in one of the other majors. Even if it falls below the viability line, it would not benefit UAM in any way to drop the major. With that being said, the number of graduates has been fairly consistent for several years. In reality, a drop in this number is a good thing because it shows that fewer students have had to fall back to this major from biology or chemistry.

Faculty

Table 7: Faculty Profile, Teaching Load, and Other Assignments (Data Source: Institutional Research)

Teaching Load shown in table below is by credit hours. * Indicates that contact hours are scheduled that are not included in the credit hour load. **Indicates that the faculty member teaches technical courses for one of the branch campuses.

Faculty Name	Status/Rank	Highest Degree	Area(s) of Responsibility	Teaching Load				Other Assignments
				Summer II	Fall	Spring	Summer I	
Abedi, Farrokh	Assoc. Prof	Ph.D.	Mathematics		12	11		Asst Dean of Mathematics
Barton, Laura	Instructor	M.S.	Mathematics		15	15	5	
Fox, Victoria Lynn	Assoc. Prof	Ph.D.	Mathematics	6	17	14	6	
Gavin, Jared	Assoc. Prof	Ph.D.	Mathematics		10*	10*		Also teaches Physics
Goodding, Alan	Instructor	MAT	Mathematics	3	18	15		
Martin, Carole	Assoc. Prof	Ed.D.	Mathematics		12*	9*		
Sandlin, Lura	Instructor	M.Ed	Mathematics		15	15		
Sayyar, Hassan	Assoc. Prof	Ph.D.	Mathematics	3	12	12	6	
Fairris, Jerry Jeff** (Crossett)	Instructor		Mathematics		3**	5**		Instructor at Crossett Campus
Hood, Jill** (McGehee)	Instructor	MAT	Mathematics		3**	**		Instructor at McGehee Campus
Burrows, Ross	Asst Prof	Ph.D.	Physics		16.5*	15*		
Abbott, Richard	Asst Professor	Ph.D.	Biology		8*	8*		Director of Sundell Herbarium

Faculty Name	Status/Rank	Highest Degree	Area(s) of Responsibility	Teaching Load				Other Assignments
Bacon, Ed	Instructor/Prof Emeritus	Ph.D.	Biology		9*	8*		Director of Turner Neal Museum / Fundraiser
Blount, Keith	Asst Prof	Ph.D.	Biology		12*	13*		
Chappell, Jessie	Lab Instructor	M.S.	Biology		13*	11*		Bio Sci Stockroom manager
Hunt, John	Professor	Ph.D.	Biology	6	11*	14*		Director of Pre-Medical Studies
Manning, Glenn	Assoc. Prof	Ph.D.	Biology	6*	16*	17*		
Morgan, Lauren	Lab Instructor	B.S.	Biology	2*	11*	9*	2*	Microbiology lab manager
Sims, Christopher	Professor	Ph.D.	Biology		14*	12*		
Stewart, Mary	Professor	Ph.D.	Biology		14*	12*		
Grilliot, Matthew	Instructor (Adjunct)	Ph.D.	Biology		4*	4*		
Stephens, Faye (McGehee)	Instructor	B.S has finished MS coursework	Biology	4*	11* **	11* **	4*	Instructor at McGehee Campus
Bramlett, J. Morris	Professor	Ph.D.	Chemistry				3*	Dean, Math and Natural Sciences Director of Pomeroy Planetarium
Hatfield, Susan	Lab Instructor	M.S.	Chemistry		15*	7*	4*	Gen Chem stockroom manager
Huang, Jinming	Assoc. Prof	Ph.D.	Chemistry		11*	10	4*	
Taylor, M. Jeffrey	Assoc. Prof	Ph.D.	Chemistry	4*	8*	12*		
Williams, Andrew	Assoc. Prof	Ph.D.	Chemistry	4*	17	16	3*	Asst Director of Research Program for Minority Students (RPMs)
Sayyar, Kelley	Instructor	M.S.	Earth Science	4*	17*	13*		
Early College High School Faculty								
Cupples, James	ADJ Instructor	M.S.	Math – Parkers Chapel H.S		3			Employed at Parkers Chapel High School
Duhan, Carmela	ADJ Instructor	M.S.	Math –Dumas H.S.		3			Employed at Dumas High School
Bridgforth, Cherie	ADJ Instructor	M.A.T.	Math-White Hall H.S.		9	9		Employed at White Hall High School
Shelvia Ross	ADJ Instructor	M.A.T.	Math-Hamburg H.S.		14	9		Employed at Hamburg High School

What significant change, if any, has occurred in faculty during the past academic year?

Dr. Karen Fawley (Biology) and Dr. Marvin Fawley (Biology) both left UAM for positions at University of the Ozarks. Dr. Charles Dolberry (Mathematics) left UAM for a position at Andrew College (Georgia). Dr. Karen Fawley was replaced by Dr. Richard Abbott, who came to us from

the Missouri Botanical Garden. Dr. Marvin Fawley was not replaced with a new position; however, his duties associated with the Research Program for Minority Students were distributed to Dr. Keith Blount (Director) and Dr. Andrew Williams (Asst. Director). Dr. Dolberry was not replaced with another Ph.D. level tenure-track faculty, but an additional instructor was hired. Ms. Lura Sandlin was hired as a Mathematics Instructor. She relieved some of the burden created by the retirement of Dr. Sam Snyder in December 2017 and the retirement of Dr. Dolberry. Ms. Faye Stephens announced that she is leaving UAM-McGehee in August 2019 to attend the veterinary medicine program at Texas A&M University.

Dr. Victoria Lynn Fox and Dr. Jared Gavin were granted tenure and promoted to the rank of Associate Professor prior to the 2018-19 academic year.

Table 8: Total Unit SSCH Production by Academic Year (ten year) (Data Source: Institutional Research)

Academic Year	Total SSCH Production	Percentage Change	Comment
2008-09	15792		not including 998 concurrent enrollment
2009-10	14852	-6.05%	not including 717 concurrent enrollment
2010-11	13842	-6.80%	not including 1314 concurrent enrollment
2011-12	14909	+7.71%	not including 1137 concurrent enrollment
2012-13	14391	-3.60%	not including 1161 concurrent enrollment
2013-14	13546	-5.88%	not including 1070 concurrent enrollment
2014-15	15550	+14.8%	not including 1403 concurrent enrollment
2015-16	14696	-5.42%	not including 1430 concurrent enrollment
2016-17	13841	-5.82%	not including 1729 concurrent enrollment
2017-18	14421	+4.19%	not including 1296 concurrent enrollment
2018-19	11915	-17.4%	not including 554 concurrent enrollment

What significant change, if any, has occurred in unit SSCH during the past academic year and what might have impacted any change?
If the data provided is accurate, the School of Math and Sciences experienced a 17.4% drop in SSCH from the previous year, not including a 57% drop in concurrent enrollment. The enrollment in many of the upper level courses was very high compared to previous years. Some of the lower level courses had lower enrollment, but to have such a large drop in SSCH was very surprising. The way the data was provided does not allow for easy checking of results.

Unit Agreements, MOUs, MOAs, Partnerships

Table 9: Unit Agreements-MOUs, MOAs, Partnerships, Etc.

Unit	Partner/Type	Purpose	Date	Length of Agreement	Date Renewed
UAM Pre-Pharmacy Program	UAMS College of Pharmacy	To provide early admissions opportunities for outstanding high school students and allow UAMS to recommend UAM as an institution to complete pre-pharmacy requirements	Feb 2017	Indefinite	annually at summer meeting by verbal agreement of both parties

List/briefly describe notable faculty recognition, achievements/awards, service activities and/or scholarly activity during the past academic year.

Faculty Scholarly Activity, 2018 Calendar Year

- Farrokh Abedi –Research Project: Mathematical Analysis of Different Genres of Music, with Jimmy Atkins, which led to professional presentation at the Posters at the Capitol event in February 2019.
- Ed Bacon – Consultant to the Arkansas Game and Fish Commission, and Consultant to the U.S. National Park Service. Led two students on aquatic biology research. One student presentation: Booth, D; Pearson, L; Sanders, B; Bacon, EJ; Biodiversity and Habitat Preferences of Aquatic Insects in the Lower Little Missouri River, Arkansas Academy of Sciences Annual Meeting, 2018.
- Keith Blount – Consultant for the Arkansas Department of Health/CDC. Several research projects related to tick and mosquito borne diseases. Has led to substantial funding (see below)
- Lynn Fox – Research Project: Identification of Noise Color on Compounded Audio Signals via an Infinite Valued Logic System and Neuro Network Learning. Presented with Allie Wynn and Rebekah DeWitt at the National Council of Undergraduate Research in Edmond, Oklahoma. Research Project: Classification of Noise Color on Distorted Audio Signals via an Adaptive Neuro-Fuzzy Inference System. Presented at the MAA Regional Conference with Ms. Allie Wynn, Russellville, AR. Research Project: Fingerprint Analysis of Fatty Acids found in Algae, with Hayden Jumper, which led to a professional presentation at the Posters at the Capitol in February 2019.
- Jinming Huang- Research project: Nitrite Formation in Vegetables. Led to one publication: Cabbage inhibits nitrite formation in other vegetables during storage, *Journal of Nutrition & Food Science 2018, 8:742.* Led to one professional presentation: Green Cabbage Inhibits Nitrite Formation in Celery juice during Storage, 26th Annual ASGC Symposium, Winthrop Rockefeller Institute, Morrilton, AR, Apr 20-21, 201
- John Hunt – Research Project: Organochloride pesticides in animal fur. Led to one publication and poster presentation: Grilliot, M.E., J. L. Hunt, and C. G. Sims. 2018. Organochloride pesticides present in animal fur, soil, and streambed in an agricultural region of southeastern Arkansas. *Journal of the Arkansas Academy of Science,* 72:106-108. Research Project: Rodent surveys, which led to one publication and presentation: Connior, M. B., R. Tumlison, D. P. Holland, J. L. Hunt, L. A. Durden, and D. B. Sasse. 2017. Survey of rodents within Arkansas Game and Fish Commission Wildlife Management Areas. *Journal of the Arkansas Academy of Science,* 71:215-218. Research Project with three students: Bomb Calorimetry to determine Energy Content in Seeds. Dr. Hunt also published four book reviews for the journal, *Choice,* and he has a book in press: Best, T. L., and J. L. Hunt. Mammals of the Southeastern United States: biology of native, extirpated, extinct, and some introduced and prehistoric species. University of Alabama Press, Tuscaloosa, AL. He is currently working on the manuscript for a second book: Best, T. L., and J. L. Hunt, Mammals of the Southwestern United States.
- Chris Sims - Research Project: Organochloride pesticides in animal fur. Led to one publication and poster presentation: Grilliot, M.E., J. L. Hunt, and C. G. Sims. 2018. Organochloride pesticides present in animal fur, soil, and streambed in an agricultural region of southeastern Arkansas. *Journal of the Arkansas Academy of Science,* 72:106-108.
- Mary Stewart – Several projects in genetics research: Led to poster presentation at the STEM Posters at the Capitol meeting: John Mitchell and Mary Stewart. Analysis of a *Drosophila melanogaster* Ribosomal Protein Gene.

- Andrew Williams – Numerous research projects in chemistry and biochemistry with nine students. These projects have led to two professional presentations: *Exploring Chromium HMC Chemistry.* ACS Southeast Regional Meeting. November 10, 2018. Little Rock, AR. Determination of Fatty Acid Content in Algae. Wells, K., Kane, J., Williams, A. Poster presented at Southwest Regional meeting of American Chemical Society. November 10th , 2018. Little Rock, AR.

Notable Faculty Recognition or Faculty/Service Projects

- Laura Barton, Director of ACTM Southeast Arkansas Regional Mathematics Contest
- Keith Blount, Director of the Research Program for Minority Students (RPMs)
- Ross Burrows, Member of the Center for Space Plasma and Aeronomic Research (CSPAR) at UA-Huntsville.
- Hassan Sayyar, Director of the Southeast Arkansas Regional Science Fair
- Mary Stewart, Hornaday Outstanding Faculty Award 2019
- Mary Stewart, Alpha Chi Teacher of the Year
- Morris Bramlett, Arkansas Dean's Association Board of Directors
- Glenn Manning, Board of Advisors for the Ouachita Mountain Biological Station
- John Hunt, Board of Governors for the Ouachita Mountain Biological Station
- Andrew Williams, Assistant Director of the Research Program for Minority Students (RPMs) and Campus Representative for the NASA, Arkansas Space Grant Consortium.

Faculty Grant Awards

- Ed Bacon, Centennial Circle Fund, $7200 for Turner Neal Museum of Natural History renovations and upgrades.
- Keith Blount, $13857 (with Glenn Manning and John Hunt) Centennial Circle Fund, Fund to upgrade teaching slides, specimens, and models for biology classrooms. $30,000 Arkansas Dept of Health for zika virus mosquito research. 1st Defence Industries, $5000 for novel tick surveillance methods.
- Jinmng Huang, UAM Faculty Research, $864 and NASA Arkansas Space Grant Consortium $4200 for Cabbage Inhibits Nitrite Formation in other Vegetables.
- Mary Stewart, Centennial Circle Fund, $5833 to purchase equipment for microbiology, genetics, and molecular biology lab. NASA, Arkansas Space Grant Consortium, $1500 for Cell growth and proliferation in wings of RpS6-Or_aca2
- Chris Sims, UAM Faculty Research, $1500, Black-bellied Whistling duck range expansion and migration in the Mississippi Alluvial Valley.

Describe any significant changes in the unit, in programs/degrees, during the past academic year.

List program/curricular changes made in the past academic year and briefly describe the reasons for the change.

The Biology major underwent a major review and several course changes were made:

- Principles of Biology I Lab was combined with Introduction to Biological Science to form Intro to Biological Science/Principles of Biology I.

    - Justification: There is a lot of overlap between the Introduction of Biology Lab and the Principles of Biology Labs. The faculty feel that it is appropriate for students in either course to take the same laboratory. By eliminating the Principles of Biology I Laboratory and having those students take the Introduction to Biological Science lab it will streamline the BIOL offerings and allow for easier scheduling of the students into laboratories. It will also make it more likely for Principles I to be offered in the spring terms. The course name and description has been changed to reflect that it counts for both entry level biology courses. The previous co-requisite would allow students to take the lab before taking the lecture. Now students must take the two at the same time or complete the lecture first. In separate C&S proposals the Principles of Biology I lab was dropped and the pre-requisites were changed for Principles of Biology II and lab to reflect this change.
- Addition of Biological Statistics
    - Justification: The faculty in Biology feel that our students are lacking in knowledge of statistics and experimental design. This course will cover those topics and will provide a better background for students entering professional programs, the workforce, or graduate school. The course is required for Organismal Biology Option students and strongly recommended for the Traditional Option students that are applying to medical school or other health related program.
- Addition of Epidemiology & Parasitology
    - Justification: This course is an excellent elective for those interested in entering a health field or those entering the workforce in a wildlife related job. The concepts covered in the course introduce the language of diseases commonly covered in medical school or other professional programs. It has been added to the Organismal Option as a Biology elective.
- The Organismal Biology major had several requirement changes:
    - The change in the Introduction to Biology/Principles of Biology I lab (Justification above)
    - The addition of Biological Statistics (Justification above)
    - The addition of Waterfowl Ecology as an elective option
        - Justification: This is a common elective taken by Organismal Biology majors that is currently included by doing a course substitution.
    - The addition of Epidemiology/Parasitology as an elective option (Justification above)
    - Seminar in Biology was removed as a major requirement
        - Justification: Students take Seminar their last semester and often put little effort into the course. We feel that we can introduce the concepts covered in this course more effectively in other courses that are currently required.
    - The math requirement changed from Compact Calculus to College Algebra and Trigonometry
        - A review of math requirements of several graduate programs indicated that in most cases college algebra and a statistics course is required and calculus is not. Trigonometry is included because it is a pre-requisite for a required Physics course.
- The Traditional Biology major had only two requirement changes
    - Principles of Biology I Lab was changed to Introduction to Biology/Principles of Biology I Lab
        - Justification above
    - Seminar in Biology was removed as a major requirement

        - Justification: Students take Seminar their last semester and often put little effort into the course. We feel that we can introduce the concepts covered in this course more effectively in other courses that are currently required.

Mathematics major, general education, and support math courses underwent a review and several changes were made.

- Fundamentals of Geometric Concepts pre-requisite changed to completion of Survey of Math or Survey of Math with Review and either MATH ACT 19 or completion of Intermediate Algebra.
    - Justification: This is a required course for students in the K-6 Education curriculum. The K-6 major is recognized by the Arkansas Dept of Higher Education as a non-STEM degree and recommends that the College Algebra requirement be removed from all non-STEM degrees. While basic algebraic skills are needed to be successful, it has been determined that the skills taught in Intermediate Algebra are sufficient for the course.
- Number Systems pre-requisite changed to completion of Survey of Math or Survey of Math with Review and either MATH ACT 19 or completion of Intermediate Algebra.
    - Justification: This is a required course for students in the K-6 Education curriculum. The K-6 major is recognized by the Arkansas Dept of Higher Education as a non-STEM degree and recommends that the College Algebra requirement be removed from all non-STEM degrees. While basic algebraic skills are needed to be successful, it has been determined that the skills taught in Intermediate Algebra are sufficient for the course.
- Introduction to Mathematical Reasoning was added as a new course.
    - Justification: The addition of this course is in effort to provide more support to students as they transition from courses focused on computation (such as Trig, Calculus I, etc.) to proof-intensive courses (such as Abstract Algebra, Number Theory, etc.). This course will include common techniques for mathematical writing and emphasize mathematical reasoning so that students have a stronger foundation and more confidence as they move into their proof-based courses. The course will be a pre-requisite for Abstract Algebra.
- Introduction to Statistics was added as a new course.
    - Justification: Current students in the mathematics major report a lack of knowledge in statistics, in general, which impacts their success in core upper-level math classes and acceptance into research/internship programs. This course will provide a background in statistical analysis, probability distributions, and experimental design for students entering the Mathematics major course work. The gain in statistical knowledge will provide students with better opportunities in passing upper-level mathematics courses and taking part in research/internship opportunities for undergraduate math students.
- The required modifications to the Mathematics major raise the number of major requirement hours to 43 and include:
    - Addition of Introduction to Mathematical Reasoning (Justification above)
    - Addition of Introduction to Statistics (Justification above)
    - A change in supportive requirements to reflect the name change of Scientific Computing to Python Programming

A change was made in one Computer Science (C S) course offered in Math and Sciences

- Name change from Scientific Computing to Python Programming

- A change in name for the course better reflects the course focus: learning PYTHON as a programming language and mimics the other CS courses in the catalog (CS 2213 and CS 2253).

Describe unit initiatives/action steps taken in the past academic year to enhance teaching/learning and student engagement.

There are numerous ways that the faculty in Math and Sciences have tried to improve student performance. Here is a list of some of those items:

1) Faculty have been encouraged to follow the plan described in the "First Four Weeks" program that was developed about 5 years ago by a committee and Academic Affairs on this campus. There are several things that are done during the first four weeks of the term to help the students be more successful. Some of these are: taking time out of class to teach the students to take notes in a course, giving lots of tips on how to study for exams, and even tips on how to take exams. Many of the items described in this plan are designed to build relationships between the students and the faculty. This was asked of all faculty by the dean.

2) Due to budget limitations, the number of tutoring hours in the Science Center were reduced this past year; however, we very carefully scheduled tutoring to be at peak times, and tried to coordinate times with the University tutoring center. Some tutors even did "on call" tutoring for students near exam times.

3) We are attempting to get students more involved as early as possibly by having social events such as mixers, museum tours, planetarium shows, and even allowing some of the younger students to tag along on on-campus field trips with upper level classes. There hasn't been a huge number of students getting involved in this way, but the ones that do love the experience.

4) We are bringing in more external speakers, especially for those that are planning to go to a professional program. We are actively recruiting the pre-professional students to come to these events. The topic of discussion is largely, "What do you have to do at UAM to be successfully accepted into ___."

5) We are asking students for feedback very early in the semester. This may be verbal, or it may be a question or two at the end of a homework or quiz. We then take this feedback and consider changes that could help the students be more successful. One such request was in an Intro to Biology class taught by Dr. John Hunt. Someone recommended having an embedded tutor in the course that would hold weekly study sessions outside of class time. Junior and senior level students were sought out, and the plan was put in place for the student to attend class every day, and then have tutoring once per week, and a review session once per week. Student turn out was low; however, the students that did come did fantastically well in the course.

6) The faculty take attendance daily, and turn in students with poor attendance or performance to academic alert as early as possible.

7) The faculty have put more effort into recruiting the younger students into the Biology Club and the Pre-Med Club. They are doing activities like Roadside Cleanup and Stream Team and going on field trips.

8) We are making efforts to get more students involved with undergraduate research. The RPMS (Research Program for Minority Students) has been very successful at getting the students involved as a freshman and helping them stay active throughout their career. Several of the minority students have attended graduate or professional programs in the last few years.

Other Unit Student Success Data

Include any additional information pertinent to this report. Please avoid using student information that is prohibited by FERPA.

- **Table 10: Acceptances into Professional Programs in the Past Year**
- **Table 11: Graduates and placement from the School of Math and Sciences July 2018-June 2019**

Table 10 Acceptances into Professional / Grad Programs in the Past Year ***Indicates graduation prior to this year**
%Indicates admission prior to earning degree

Student identifier	Major	Major	Placement
%A	Biology	Biochemistry	UAMS College of Pharmacy
*B	Chemistry		UAMS College of Pharmacy
%C	Biology	Biochemistry	UAMS College of Pharmacy
%D	Biochemistry		UAMS College of Pharmacy
E	Biology	Biochemistry	Northeastern State (Okla) Univ. College of Optometry
F	Biology	Biochemistry	UAMS College of Medicine
G	Mathematics		UCA Masters program in Mathematics
H	Biology		MBA Program at
I	Biology –Organismal		Research Internship at Michigan State Univ
J	Biology		Colorado State masters of biomedical science program
K	Nat Sci –Life Science		UAMS Medical Lab Technician program
L	Biology	Biochemistry	Univ. Louisiana Lafayette College of Engineering
*M	Biology	Biochemistry	Texas A&M College of Veterinary Medicine
N	Biology		UAM MAT program
O	Biology		UAM MAT program
P	Biology		UAM MAT program
Q	Biology		UAM MAT program
R	Biology		UAM MAT program
*S	Biology-Organismal		Baptist Health Professions –Histology Technician program

Table 11 Graduates from the School of Math and Sciences July 2017 – June 2018

Name	Date	Major	Major	Placement
1	May 19	Nat Sci – Life Sci		Employed at UAM, plans to enter Teach for America
2	May 19	Mathematics		Masters Program in Mathematics at UCA
3	May 19	Biology		UAM MAT Program, teaching science at Hermitage
4	May 19	Biology		UAM MAT Program, teaching at Crossett, AR
5	May 19	Biology-Organismal		Summer Internship at Michigan State Univ,

6	May 19	Mathematics		Applying to graduate programs
7	May 19	Biology	Biochemistry	Military Service
8	May 19	Biology		UAM MAT Program
9	May 19	Biology		UAM MAT Program
10	May 19	Biology	Biochemistry	Optometry School, Northeastern State University (Okla)
11	May 19	Biology		Seeking employment locally
12	May 19	Biology		Recently had a child. No plans to work until spring
13	May 19	Chemistry	Mathematics	Ph.D. program in Chemistry at UA
14	May 19	Biology		Masters Program in Biomedical Sci at Col. State Univ
15	May 19	Biochemistry		Harding University College of Pharmacy
16	May 19	Biochemistry		UAMS College of Pharmacy
17	May 19	Biology		Applying to Physicians Assistant program at UAMS
18	May 19	Biology		Marine Biology Summer Internship in Florida
19	May 19	Biology		Logan College of Chiropractic Medicine
20	May 19	Biology		Applying to graduate programs in Biology
21	May 19	Biochemistry		UAMS College of Pharmacy
22	May 19	Nat Sci-Life Science		Medical Lab Technician program at UAMS
23	May 19	Biology	Biochemistry	Applying to Pharmacy School for 2020
24	May 19	Biology	Biochemistry	Applying for industrial chem positions near Texarkana
25	May 19	Biology		MBA Program
26	May 19	Nat Sci-Life Science		UAM as Asst Athletic Trainer
27	May 19	Biology	Biochemistry	UAMS College of Medicine
28	May 19	Biology		MAT Program at UAM, teaching Math in Warren, AR
29	May 19	Biology	Biochemistry	Engineering program at Univ. of Louisiana Lafayette
30	May 19	Biology		Technical School
31	Dec 18	Biochemistry		Harding University College of Pharmacy
32	Dec 18	Nat Sci-Life Science		Jefferson School of Nursing

Revised February 8, 2018

Addendums

Addendum 1: UAM Vision, Mission, and Strategic Plan

VISION

The University of Arkansas at Monticello will be recognized as a model, open access regional institution with retention and graduation rates that meet or exceed its peer institutions.
Through these efforts, UAM will develop key relationships and partnerships that contribute to the economic and quality of life indicators in the community, region, state, and beyond.

MISSION

The University of Arkansas at Monticello is a society of learners committed to individual achievement by:
- Fostering a quality, comprehensive, and seamless education for diverse learners to succeed in a global environment;
- Serving the communities of Arkansas and beyond to improve the quality of life as well as generate, enrich, and sustain economic development;
- Promoting innovative leadership, scholarship, and research which will provide for entrepreneurial endeavors and service learning opportunities;
- Creating a synergistic culture of safety, collegiality, and productivity which engages a diverse community of learners.

CORE VALUES:

- *Ethic of Care*: We care for those in our UAM community from a holistic perspective by supporting them in times of need and engaging them in ways that inspire and mentor.
- *Professionalism*: We promote personal integrity, a culture of servant leadership responsive to individuals' needs as well as responsible stewardship of resources.
- *Collaboration*: We foster a collegial culture that encourages open communication, cooperation, leadership, and teamwork, as well as shared responsibility.
- *Evidence-based Decision Making*: We improve practices and foster innovation through assessment, research, and evaluation for continuous improvement.
- *Diversity*: We embrace difference by cultivating inclusiveness and respect of both people and points of view and by promoting not only tolerance and acceptance, but also support and advocacy.

UAM STUDENT LEARNING OUTCOMES:

- *Communication:* Students will communicate effectively in social, academic, and professional contexts using a variety of means, including written, oral, quantitative, and/or visual modes as appropriate to topic, audience, and discipline.
- *Critical Thinking:* Students will demonstrate critical thinking in evaluating all forms of persuasion and/or ideas, in formulating innovative strategies, and in solving problems.

- *Global Learning:* Students will demonstrate sensitivity to and understanding of diversity issues pertaining to race, ethnicity, and gender and will be capable of anticipating how their actions affect campus, local, and global communities.
- *Teamwork:* Students will work collaboratively to reach a common goal and will demonstrate the characteristics of productive citizens.

STRATEGIC PLAN

1. STUDENT SUCCESS—fulfilling academic and co-curricular needs

 Develop, deliver, and maintain quality academic programs.
o Enhance and increase scholarly activity for undergraduate and graduate faculty/student research opportunities as well as creative endeavors.
o Revitalize general education curriculum.
o Expand academic and degree offerings (technical, associate, bachelor, graduate) to meet regional, state, and national demands.

 Encourage and support engagement in academics, student life, and athletics for well-rounded experience.
o Develop an emerging student leadership program under direction of Chancellor's Office.
o Enhance and increase real world engagement opportunities in coordination with ACT Work Ready Community initiatives.
o Prepare a Student Affairs Master Plan that will create an active and vibrant student culture and include the Colleges of Technology at both Crossett and McGehee.

 Retain and recruit high achieving faculty and staff.
o Invest in quality technology and library resources and services.
o Provide opportunities for faculty and staff professional development.
o Invest in quality classroom and research space.
o Develop a model Leadership Program (using such programs as American Council on Education, ACE and/or Association of American Schools, Colleges, and Universities, AASCU) under the direction of the Chancellor's Office to grow our own higher education leaders for successive leadership planning.
o Create an Institute for Teaching and Learning Effectiveness.

 Expand accessibility to academic programs.
o Engage in institutional partnerships, satellite programs, alternative course delivery, and online partnerships with eVersity.
o Create a summer academic enrichment plan to ensure growth and sustainability.
o Develop a model program for college readiness.
o Revitalize general education.
o Coordinate with community leaders in southeast Arkansas to provide student internships, service learning, and multi-cultural opportunities.

2. ENROLLMENT and RETENTION GAINS

 Engage in concurrent enrollment partnerships with public schools, especially in the areas of math transition courses.
 Provide assistance and appropriate outreach initiatives with students (working adults, international, transfers, and diversity) for successful transition.
 Coordinate and promote marketing efforts that will highlight alumni, recognize outstanding faculty and staff, and spotlight student success.
 Develop systematic structures for first year and at-risk students.
 Identify and enhance pipeline for recruiting

3. INFRASTRUCTURE REVITALIZATION and COLLABORATIONS
 Improve Institutional Effectiveness and Resources through participation in a strategic budget process aligned with unit plans and goals for resource allocations.

 Conduct and prepare Economic Impact Studies to support UAM efforts and align program and partnerships accordingly.

 Prepare and update University Master Plan.

 Partner with system and state legislators to maximize funding.

 Increase external funding opportunities that will create a philanthropic culture among incoming students, graduates, and community.
o Increased efforts to earn research and grant funds.
o Creation of philanthropic culture among incoming students, graduates and community.
Collaborating with Athletics Fundraising to maximize synergies.
Create a Growing our Alumni Base Campaign.
o Encourage entrepreneurial opportunities where appropriate.
o Participation in articulation agreements to capitalize on academic and economic resources.
o Partner with communities to address the socio economic, educational, and health and wellness (safety needs) of all citizens.

Addendum 2: Higher Learning Commission Sample Assessment Questions

1. How are your stated student learning outcomes appropriate to your mission, programs, degrees, students, and other stakeholders? How explicitly do major institutional statements (mission, vision, goals) address student learning?

- How well do the student learning outcomes of programs and majors align with the institutional mission?
- How well do the student learning outcomes of general education and co-curricular activities align with the institutional mission?
- How well do course-based student learning outcomes align with institutional mission and program outcomes?
- How well integrated are assessment practices in courses, services, and co-curricular activities?
- How are the measures of the achievement of student learning outcomes established? How well are they understood?

2. What evidence do you have that students achieve your stated learning outcomes?

- Who actually measures the achievement of student learning outcomes?

- At what points in the curriculum or co-curricular activities are essential institutional (including general education), major, or program outcomes assessed?
- How is evidence of student learning collected?
- How extensive is the collection of evidence?

3. In what ways do you analyze and use evidence of student learning?

- Who analyzes the evidence?
- What is your evidence telling you about student learning?
- What systems are in place to ensure that conclusions are drawn and actions taken on the basis of the analysis of evidence?
- How is evidence of the achievement of student learning outcomes incorporated into institutional planning and budgeting?

4. How do you ensure shared responsibility for student learning and assessment of student learning?

- How well integrated are assessment practices in courses, services, and co-curricular activities?
- Who is responsible for the collection of evidence?
- How cross-functional (i.e., involving instructional faculty, Student Affairs, Institutional
- Research, and/or relevant administrators) are the processes for gathering, analyzing, and using evidence of student learning?
- How are the results of the assessment process communicated to stakeholders inside and outside the institution?

5. How do you evaluate and improve the effectiveness of your efforts to assess and improve student learning?

- What is the quality of the information you have collected telling you about your assessment processes as well as the quality of the evidence?
- How do you know how well your assessment plan is working?

6. In what ways do you inform the public about what students learn—and how well they learn it?

- To what internal stakeholders do you provide information about student learning?
- What is the nature of that information?
- To what external stakeholders do you provide information about student learning?
- What is the nature of that information?

Addendum 3: Arkansas Productivity Funding Metrics

- The productivity funding formula consists of four categories: Effectiveness (80% of formula), Affordability (20% of formula), Adjustments, and Efficiency (+/-2% of formula).

Effectiveness	Affordability	Adjustment	Efficiency
• Credentials • Progression • Transfer Success • Gateway Course Success	• Time to Degree • Credits at Completion	• Research (4-year only)	• Core Expense Ratio • Faculty to Administrator Salary